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NOTES ON AMERICAN SPIDERS OF THE FAMILY THOMISIDÆ

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Considerable confusion has existed as to the number of species of *Tibellus* in the United States and their identification with spiders described from Europe. In 1847 Hentz described a species from Georgia, placing it in the genus *Thomisus* and naming it for its discoverer, Thomas R. Dutton. As early as 1880 Keyserling correctly identified Hentz's species and redescribed it, giving good figures of the palpus and epigynum and comparing it with *Tibellus oblongus* (Walckenaer), a European species. On the basis of specimens from Mount Washington and Colorado he recorded this latter species from the United States. The nomenclatorial vicissitudes of our spiders of this genus since that time have been unique. In a supplementary plate in the reprint of Hentz's 'Spiders of the United States,' published in 1875, Emerton had already figured the palpus of a specimen of *Tibellus* from Oklahoma, in which the embolus was much inflated basally and the whole deeply grooved, as the *Thomisus duttoni* of Hentz. Later (1892) this same author, apparently not attaching specific import to the quite different embolus, though he recognized the anatomical disparity, figured as *Tibellus duttoni* (Hentz) the common northern species in which the tube is longer and comparatively slender. Probably on the basis of these figures of Emerton and some specimens of this latter type, Simon in 1895 in his 'Histoire Naturelle des Araignes' synonymized *T. duttoni* with *oblongus* and recorded it and *T. propinquus* from the United States. Both of these had been treated in his 'Arachnides de France' in 1875. Kulczynski, in 1908, recognizing that Simon had erred in his identifications, showed *Tibellus propinquus* Simon to be the true *T. oblongus* of Walckenaer and *oblongus* of Simon to be synonymous with *T. maritimus* (Menge). On the basis of Emerton's first figure he recorded this latter species, also found in Europe, from the United States. Strangely, Petrunkevitch in his 'Synonymic Index Catalogue' listed only *Tibellus oblongus* from the United States.

A study of numerous collections of these spiders from the United States shows that there are at least four species in this country. *Tibellus*

oblongus (Walckenaer) is found from coast to coast in North America and from the southern states far north into Canada. It is widely distributed in Europe. *T. maritimus* (Menge) has the same distribution but is comparatively rare throughout its range. Both these species are replaced to an extent in the southeastern states by *Tibellus duttoni* (Hentz) and in the southwestern states by *Tibellus chamberlini*, new species, both being more slender forms with longer legs. A fifth species of the genus is found in Cuba and is herein described from a single female example. Three other species, from Mexico, Paraguay, and Guiana respectively, though imperfectly known, bring the number of species in the Americas to a total of eight.

I am pleased to acknowledge the loan of much material for determination and distributional data from Dr. Chamberlin of the University of Utah, Professor Crosby of Cornell University, and Professor Chidester, Albion College, Michigan. To Miss E. B. Bryant of the Museum of Comparative Zoölogy I am indebted for the loan of specimens, drawings, and much help in the involved synonymy of the group.

TIBELLUS E. Simon

1875, 'Les Arachnides de France,' II, p. 307.

Thomisid spiders of the subfamily Philodrominæ.

Integuments with plumose hairs. Cephalothorax longer than broad, the width at the front much less than half the width at the widest point. Eyes in two recurved rows, all small, the anterior row much shorter. Median ocular quadrangle as broad as or broader than long, narrowed in front, the eyes subequal, smaller than the anterior laterals, which are always smaller than the posterior laterals. Lower margin of the furrow of the chelicerae unarmed, the upper with two teeth. Labium comparatively short, truncated or rounded at the distal end. Leg formula 2413, very long, the tarsi scopulate, the claws of normal size. Palp of the male with the tibial apophysis much reduced or wanting. Abdomen very elongate, the sides nearly parallel.

This genus has close affinities with *Apollophanes* Cambridge and *Thanatus* C. Koch. From *Apollophanes* it differs in its narrower cephalothorax, in the greater distance between the posterior median and posterior lateral eyes, and in having the last pair of legs longer than the first pair. From *Thanatus* it differs in that the anterior median eyes are much nearer together than to the laterals and in the longer cephalothorax, but both have the fourth leg somewhat longer than the first.

KEY TO MALES

- 1.—Anterior tibiae with three pairs of spines beneath. 2.
- Anterior tibiae with four pairs of spines beneath. 4.
- 2.—Tibia with a distinct apophysis. *T. punctulatus* (Taczanowski).
- Tibia with only a slight apophysis or with none. 3.

- 3.—Embolus basally much inflated, grooved..... *T. maritimus* (Menge).
Embolus straight, not much thicker at base, distally grooved.
T. oblongus (Walckenaer).
- 4.—Tibia with a conspicuous black maculation at base on dorsal surface.
T. paraguensis Simon.
- Tibia without such a marking.....5.
- 5.—Embolus distally somewhat hooked (southeastern United States).
T. duttoni (Hentz).
- Embolus straighter (southwestern United States)... *T. chamberlini*, new species.

KEY TO FEMALES

- 1.—Anterior tibiæ with three pairs of spines beneath.....2.
Anterior tibiæ with four pairs of spines beneath.....4.
- 2.—Epigynal plate longitudinally sulcate.....3.
Epigynal plate not longitudinally sulcate..... *T. oblongus* (Walckenaer).
- 3.—Median piece narrower or as narrow at genital furrow as between the openings.
T. maritimus (Menge).
- Median piece much broader at genital furrow.... *T. punctulatus* (Taczanowski).
- 4.—Tibia with a conspicuous black maculation at base on dorsal surface.
T. paraguensis Simon.
- Tibia without such a marking.....5.
- 5.—Median piece half as broad as the epigynal plate; openings set obliquely.
T. insularis, new species.
- Median piece less than a third as broad as the epigynal area.....6.
- 6.—Lateral margins of epigynal plate evenly rounded; median piece as long as the width at base..... *T. chamberlini*, new species.
- Lateral margins of epigynal plate constricted anteriorly; median piece only half as long as basal width..... *T. duttoni* (Hentz).

***Tibellus oblongus* (Walckenaer)**

Figures 1, 2, 3

Aranea oblonga WALCKENAER, 1802, *Faune Francaise*, II, p. 228.*Thomisus oblongus* WALCKENAER, 1805, 'Tabl. Aran.', p. 38, Pl. iv, fig. 39.
HAHN, 1831, 'Die Arachniden,' I, p. 40, Pl. xxviii, fig. 82.*Philodromus oblongus* WALCKENAER, 1825, 'Aran. de France,' p. 94, Pl. vi, fig. 9; 1837, 'Ins. Apt.,' I, p. 558. BLACKWALL, 1861, 'Spiders Gr. Britain and Ireland,' p. 100, Pl. v, fig. 60.*Philodromus trilineatus* SUNDEVAL, 1833, 'Svensk. Spindl.,' p. 127.*Thanatus parallelus* C. KOCH, 1838, 'Die Arachniden,' IV, p. 87, Pl. cxxxii, fig. 307.*Thanatus oblongus* MENGE, 1874, 'Preussische Spinnen,' Naturforschenden Gesellschaft, Danzig, pp. 396-398, Pl. LXVII, fig. 224 (not female).*Thanatus maritimus* MENGE, 1874, 'Preussische Spinnen,' idem, pp. 398-399, Pl. LXVII, fig. 225 (not male).*Tibellus propinquus* SIMON, 1875, 'Les Arachnides de France,' II, pp. 309-310.*Tibellus oblongus* KEYSERLING, 1880, 'Die Spinnen Amerikas,' Laterigradæ, p. 196. SIMON, 1895, 'Hist. Nat. Araignes,' I, p. 1065; 1903, Bull. Mus. Paris, IX,

p. 386. KULCZYNSKI, 1908, 'Aran. et Oribat.,' Mem. de l'Academie Imperiale, St. Petersburg, VIII Serie, pp. 69-70.

† *Tibellus parallelus* KULCZYNSKI, 1891, 'Araneæ Hungariæ,' I, p. 115, Tab. iv, fig. 27.

Tibellus duttoni EMERTON, 1892, Trans. Conn. Acad. Sci., VIII, p. 378; 1902, 'Common Spiders,' p. 39, Figs. 114-116.

MALE.—Total length, 6.65 mm.

The integument of the cephalothorax varies from light yellow to brown or very dark brown in melanic specimens. Conspicuous on the carapace are three longitudinal brown bands: a median one that is anteriorly about as wide as the first row of eyes and which narrows to half of that width behind, and two lateral marginal bands beginning at a point laterad of the posterior lateral eye of each side and continuing posteriorly the remainder of the length of the carapace. The intervals between these stripes form two broader light yellow longitudinal bands with few invading brown markings. The eye tubercles are black. The sternum, labium, and endites are yellow, thickly speckled with brown, much darker than the legs and palps, which are yellow or light brown and are usually sparsely maculate or irrorate with brown flecks. Some males from southern Utah have the femora of all the legs and the dorsum of the cephalothorax and the abdomen tinged a bright red.

The abdomen varies from gray to bright yellow, the dorsum with a median and two lateral brown bands as on the carapace, the median more plainly indicated, the venter entirely marked with brown or showing a median longitudinal broad dark band. Not uncommonly the color material arranges itself, as is characteristic of *Tetragnatha*, in blotches defined by lighter reticulations. At each side of the median band on the dorsum, approaching the end of the abdomen, is a small black spot. Spinnerets lighter than the venter.

Carapace, 2.70 mm. long, 2.10 mm. wide, .95 mm. in front.

Anteriorly the cephalothorax is armed with a few short spines in the region of the eyes and longer ones on the margin of the clypeus. The flat carapace is considerably longer than wide, truncate behind, the sides gently rounded anteriorly, to a constriction at the second eye-row, squared off in front, the width at that point being less than half the width of the carapace at the widest point. Both of the parts of the prosoma are on about the same plane, the thoracic furrow defining the pars cephalica poorly defined, the convex sides of the pars thoracica gently dropping to the margins. The clypeus is sloping and scarcely exceeds the height of the median ocular quad.

The eyes form two transverse recurved rows, those of the anterior with the medians two and one-half times their diameter apart and separated from the slightly larger laterals ($\frac{5}{4}$) by little more than their diameter, the posterior row much wider than the anterior, the curvature greater, the laterals equal to the anterior laterals. The posterior lateral eye of each side is somewhat farther removed from the anterior lateral than from the posterior median eye ($\frac{2}{13}$). The four median eyes form a quadrangle narrower in front ($\frac{18}{23}$) and broader than long as measured from above, the anterior medians equal to the posterior medians which are spaced nearly four times their diameter apart ($\frac{4}{15}$), nearer together ($\frac{15}{18}$) than to the posterior laterals.

Each chelicera is about twice as long as its width at base and distally narrowed, the upper margin armed with two teeth, the lower edentulate. The cordate sternum extends between the coxæ of the last pair of legs and ends in a blunt point. The labium is as long as broad and about half as long as the convergent maxillæ.

Abdomen, 4.05 mm. long, 1.3 mm. wide at genital furrow.

The abdomen is nearly four times as long as its greatest width and somewhat overlaps the posterior portion of the carapace.

The leg formula is 2413, the second being about five times the length of the carapace.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.20	1.30	2.80	2.00	1.25	10.55 mm.
II	3.80	1.20	3.40	2.95	1.85	13.10 mm.
III	2.65	1.00	2.07	1.77	1.01	8.50 mm.
IV	3.80	1.15	3.07	2.65	1.45	12.12 mm.

Although the spines are extremely variable in their length and are often missing from comparable members of the same spiders, the normal formula for all the legs seems to be the following.

	FEMUR	PATELLA	TIBIA	METATARSUS
Dorsal	1-1-1	0-0	0-0-1-0	0-0-0
Ventral	0-0-0	0-0	2-2-0-2	2-2-0
Prolateral	1-1-1	1-1	1-1-1-0	1-1-0
Retrolateral	1-1-1	1-0	1-1-1-0	1-1-0

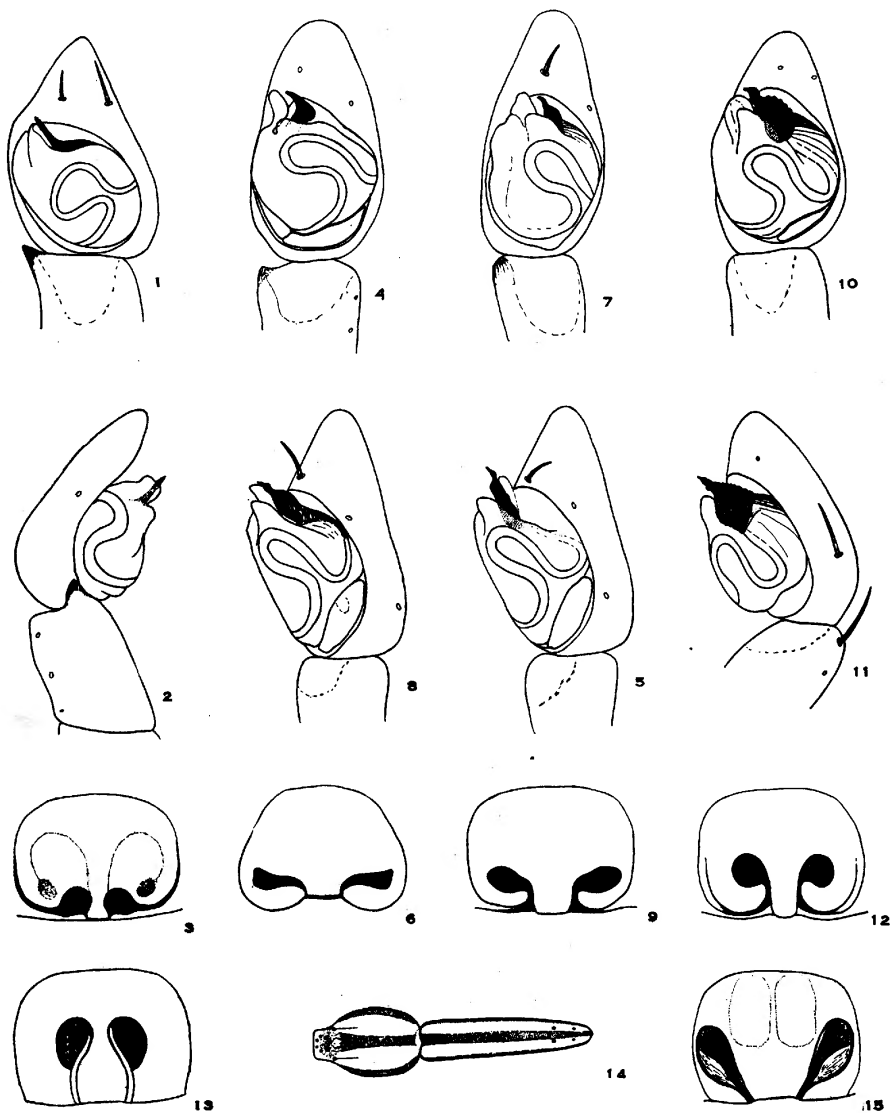
Tibia of male palpus: dorsal 2-1, ventral 0, prolateral 1-1, retrolateral 0. Tarsus: dorsal 2 basal, ventral 2 distal, prolateral 1 basal, retrolateral 0.

MALE PALPUS.—The femur is slightly longer than the patella and tibia which are equal in length as viewed from the lateral aspect. The tibia is slightly longer than broad and has on the outer margin a short but distinct tibial apophysis. On the inner (prolateral) surface of the tibial joint are two conspicuous, long black spines. The terminal joint of the palpus is longer than broad and clothed with black hairs and a few spines, the margin behind the embolus being set with a single line of slender bristles. The last joint of the palpus is bent downward and is so articulated to the tibia that it is twisted toward the outer side. The bulb is set obliquely with the straight black embolus pointing outward. Distally the embolus is twisted, resembling a screw. The course of the seminal duct on the bulb is somewhat variable.

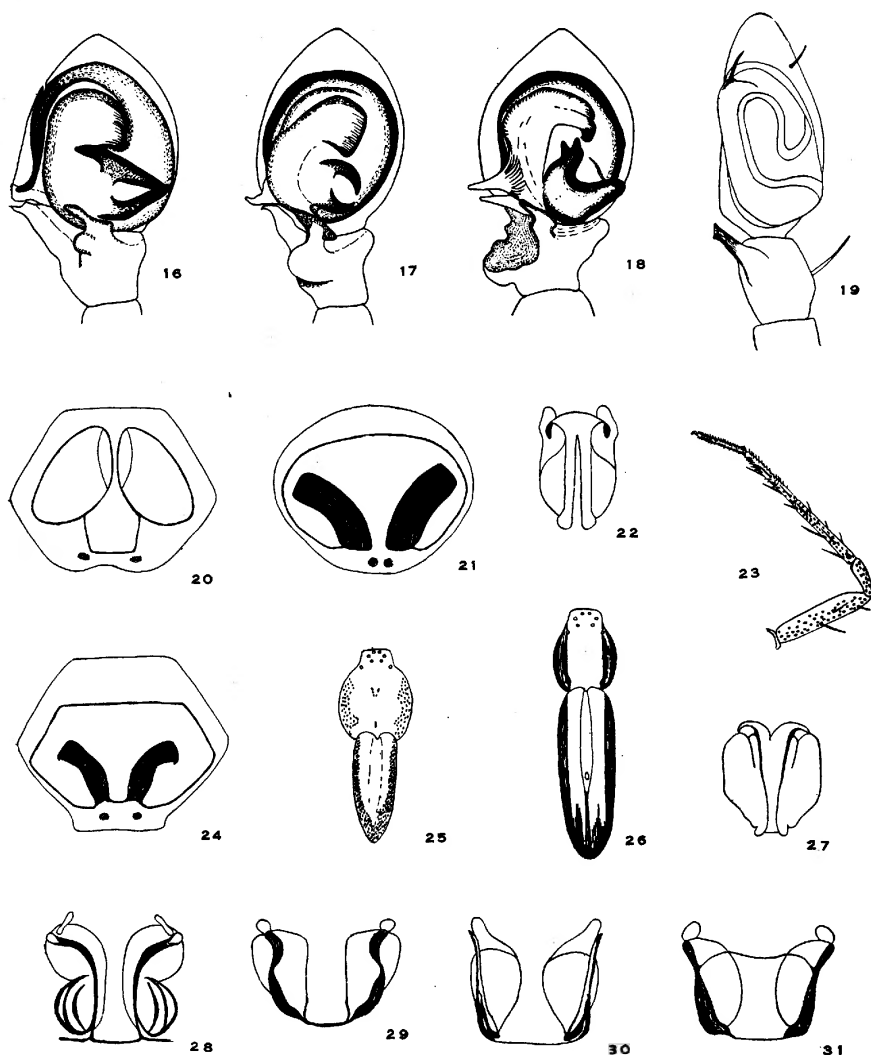
FEMALE.—Although in pattern the female closely approximates the male, the color is always much lighter. The characteristic bands of the carapace and the dorsum of the abdomen are well defined but the dark sternum and venter are usually lacking. On the average the male is a more slender spider, with the legs longer and with a more slender abdomen, which difference is greatly accentuated in females distended with eggs. The eye arrangement in the female is like that of the male, the anterior and posterior medians slightly farther separated.

Total length, 7.75 mm. Cephalothorax, 3.05 mm. long, 2.40 mm. wide, .95 mm. wide at the front. Abdomen, 5.00 mm. long, 1.75 mm. wide. The leg formula is 2413, the second leg about four times the length of the carapace.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.35	1.42	2.75	2.25	1.55	11.32 mm.
II	3.85	1.42	3.30	2.65	1.75	12.97 mm.
III	2.75	1.05	2.05	1.65	1.05	8.55 mm.
IV	3.85	1.25	2.90	2.45	1.45	11.90 mm.
Palp	.97	.52	.55		.95	2.99 mm



- Fig. 1. *Tibellus oblongus* (Walckenaer), male palpus, ventral view.
 Fig. 2. *Tibellus oblongus* (Walckenaer), male palpus, retrolateral view.
 Fig. 3. *Tibellus oblongus* (Walckenaer), epigynum.
 Fig. 4. *Tibellus duttoni* (Hentz), male palpus, ventral view.
 Fig. 5. *Tibellus duttoni* (Hentz), male palpus, prolateral view.
 Fig. 6. *Tibellus duttoni* (Hentz), epigynum.
 Fig. 7. *Tibellus chamberlini*, new species, male palpus, ventral view.
 Fig. 8. *Tibellus chamberlini*, new species, prolateral view.
 Fig. 9. *Tibellus chamberlini*, new species, epigynum.
 Fig. 10. *Tibellus maritimus* (Menge), male palpus, ventral view.
 Fig. 11. *Tibellus maritimus* (Menge), male palpus, prolateral view.
 Fig. 12. *Tibellus maritimus* (Menge), epigynum.
 Fig. 13. *Tibellus punctulatus* (Taczanowski), epigynum (after Keyserling).
 Fig. 14. *Tibellus chamberlini*, new species, male, dorsal view.
 Fig. 15. *Tibellus insularis*, new species, epigynum.



- Fig. 16. *Xysticus paiutus*, new species, male palpus, ventral view.
 Fig. 17. *Xysticus gosiutus*, new species, male palpus, ventral view.
 Fig. 18. *Xysticus coloradensis* Bryant, male palpus, ventral view.
 Fig. 19. *Apollophanes paraguensis*, new species, male palpus.
 Fig. 20. *Xysticus paiutus*, new species, epigynum.
 Fig. 21. *Xysticus gosiutus*, new species, epigynum.
 Fig. 22. *Apollophanes bryanti*, new species, epigynum.
 Fig. 23. *Apollophanes paraguensis*, new species, first leg of female.
 Fig. 24. *Xysticus apacheus*, new species, epigynum.
 Fig. 25. *Apollophanes paraguensis*, new species, male, dorsal view.
 Fig. 26. *Apollophanes bryanti*, new species, female, dorsal view.
 Fig. 27. *Apollophanes paraguensis*, new species, epigynum.
 Fig. 28. *Apollophanes indistinctus*, new species, epigynum.
 Fig. 29. *Apollophanes arizonensis*, new species, epigynum.
 Fig. 30. *Apollophanes similalis*, new species, epigynum.
 Fig. 31. *Apollophanes mexicanus*, new species, epigynum.

The spine formula for the female is like that of the male, but in some cases the dorsal basal spine on the anterior femora is lacking.

The specific name *oblongus* has been used by arachnologists for over a hundred years as a pigeonhole for any species of *Tibellus* coming into their collections. It is indeed fortunate that this is such a widely distributed spider and that a large proportion of the records probably belongs here. The involved synonymy is ample evidence of the confusion that has existed in regard to this species and to others related to it. Kulczynski in 1908 pointed out the discrepancies in nomenclature and hazarded that *Tibellus parallelus* (C. Koch) (in agreement with Simon) was worthy of specific designation. Most of the specimens from the United States have the embolus distally grooved in keeping with the diagnosis of this synonymized form, but I fail to see differences other than intraspecific in our specimens and retain the older name.

T. oblongus (Walckenaer) is found throughout Europe and Asia and distributed in North America from Alaska across to eastern Canada and south to Mexico, becoming scarcer in its southern limits.

Tibellus maritimus (Menge)

FIGURES 10, 11, 12

Thanatus maritimus MENGE, 1874, 'Preussische Spinnen,' Naturforschenden Gesellschaft, Danzig, pp. 398-399, Pl. LXVII, fig. 225 (not female).

Thanatus oblongus MENGE, 1874, 'Preussische Spinnen,' idem, pp. 396-398, Pl. LXVII, fig. 224 (not male).

Thomisus duttoni HENTZ, 1875, Occas. Papers Boston Soc. Nat. Hist., II, p. 81, Pl. XX, fig. 11 (plate by Emerton).¹

Tibellus oblongus SIMON, 1875, 'Les Arachnides de France,' II, pp. 311-312. CHYZER AND KULCZYNSKI, 1891, 'Aranæ Hungariæ,' I, p. 115, Tab. IV, figs. 28a-b.

Tibellus maritimus KULCZYNSKI, 1908, 'Aran. et Oribat.,' Mem. de L'Académie Impériale, St. Petersburg, VIII Serie, pp. 69-70.

MALE.—Total length, 6.15 mm. Cephalothorax, 2.80 mm. long, 2.05 mm. wide, .92 mm. wide in front. Abdomen, 3.35 mm. long, 1.30 mm. wide.

On the basis of coloration this species cannot be separated from the one described above, with which it has been confused in literature. The proportions of the carapace and the abdomen are decidedly similar, as are the eye relations, the spining of the legs and the armature of the upper furrow of the chelicerae. The legs average a little shorter, the second pair being only four times as long as the carapace.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	2.95	1.80	2.60	2.15	1.32	10.82 mm.
II	3.45	1.45	2.92	2.37	1.45	11.64 mm.
III	2.50	1.02	1.65	1.55	.85	7.57 mm.
IV	3.47	1.12	2.82	2.40	1.45	11.26 mm.

¹Supplementary notes in brackets by Emerton in the 'Spiders of the United States' (reprint) refer to this species.

The spine formula of the male agrees in all details with that of *Tibellus oblongus* (Walckenaer).

The female agrees in all structural details with that sex for *T. oblongus*. The epigynum as figured is longitudinally sulcate and readily distinguishable from that of any of the other species. The characteristic distal black spots on the dorsum of the abdomen are missing in every specimen that I have seen.

This is the spider Emerton figured as *Thomisus duttoni* Hentz in the 'Spiders of the United States.' In Trans. Conn. Acad. Sci., VIII, April, 1892, p. 378, he says: "I have not been able to find the spider whose palpus was figured by me on plate 20 of the reprint of Hentz's spiders of the United States in 1875. All that I have seen since have the slender portion of the tube longer. . . ."

This species was erroneously described as *T. oblongus* by Simon in his 'Arachnides de France,' 1875, and he was subsequently followed by European workers. Specimens from the Paris Museum kindly sent me by Miss Bryant under the above name agree perfectly with representatives from the United States. Kulczynski was the first to point out the error of Simon's determination and reinstated Menge's species, synonymizing *T. propinquus* Simon with the true *T. oblongus*.

Tibellus maritimus (Menge) has the same range as *Tibellus oblongus* but is of much less frequent occurrence. I have a male from Zion National Park, in southern Utah, which probably indicates the most southern distribution of the spider in the United States. Menge's specimens were from Germany, where he recorded it as being fairly common.

***Tibellus punctulatus* (Taczanowski)**

Figure 13

Thanatus punctulatus TACZANOWSKI, 1872, Horæ Soc. Entom. Ross., IX, p. 10.

Tibellus punctulatus KEYSERLING, 1880, 'Die Spinnen Amerikas,' Laterigradæ, p. 197, Pl. v, fig. 108. CHAMBERLIN, Bull. Mus. Comp. Zoöl., LX, No. 6, p. 264.

An immature female from Santa Ana, Peru (Mus. Comp. Zoöl., p. 253), referred to this species by Chamberlin, is a somewhat more slender spider than *T. oblongus* (Walckenaer), but agrees in having only three pairs of spines under the first and second tibiæ. At the basal end of the tibiæ of the dorsal surface on all the legs is a conspicuous black marking. The epigynum as figured by Keyserling is longitudinally sulcate, the median piece very broad and the openings large. The male agrees with *Tibellus vittatus* Thorell (*macellus* Simon) in possessing a distinct tibial apophysis.

This species is known only from Guiana and Peru.

Tibellus paraguensis Simon

Tibellus paraguensis SIMON, 1897, *Museu Torino*, XII, No. 270, p. 7.

I refer an immature female from S. Louis, Paraguay, to Simon's species, as it agrees in most particulars with his diagnosis. Beneath the tibiae of the first legs are four pairs of spines, the medians much nearer together than their distance from the distal or basal pairs. In other details this species is very close to *T. punctulatus* (Taczanowski) and has the same black maculation at the basal ends of the tibiae above on all the legs. "Plaga vulva rufula, coriacea, subrotunda, longitudinaliter sulcata."

This species has been found only at Asuncion (the type locality) and S. Louis, Paraguay.

Tibellus chamberlini, new species

Figures 7, 8, 9, 14

MALE.—Total length, 7.15 mm. Cephalothorax, 2.60 mm. long, 2.00 mm. wide, .80 mm. in front. Abdomen, 4.65 mm. long, 1.40 mm. wide.

This species, a more slender spider than *T. oblongus* (Walckenaer), has the same color characteristics of other species of the genus. The median dorsal marking of the cephalothorax is continuous with a like one running the whole length of the slender abdomen. The lateral longitudinal marginal stripes of the carapace are well defined, those of the abdomen not visible from above but distinct from the lateral aspect. At the distal end of the cylindrical abdomen are the two black spots as in the other species and usually a second pair behind less distinct and often entirely missing.

The eyes form two strongly recurved rows, the first with the eyes subequal, separated by their diameter, the second row with the laterals a little larger, the medians separated twice their diameter and nearly twice as far from the laterals. The median ocular quadrangle is longer than broad, narrower in front ($\frac{1}{2}$).

The leg formula is 2413, the second being about five and one-half times the length of the carapace.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.40	1.30	2.95	2.50	1.52	11.67 mm.
II	3.95	1.45	3.60	3.10	1.90	14.30 mm.
III	2.55	.85	1.90	1.70	1.00	8.30 mm.
IV	4.30	1.15	3.40	2.95	1.50	13.30 mm.

The normal spine formula seems to be the following for both sexes.

	FEMUR	PATELLA	TIBIA	METATARSUS
Dorsal	1-1-1	1-0	0-0-1-0	0-0-0
Ventral	0-0-0	0-0	2-2-2-2	2-2-0
Prolateral	1-1-1	1-0	1-1-1-0	1-1-0
Retrolateral	1-1-1	1-0	1-1-1-0	1-1-0

The tibia of the male palpus is without an apophysis, slightly longer than the patella, which two joints taken together are as long as the tarsus. The bulb and the embolus are very much as in *T. duttoni* but the figure will show their differences.

FEMALE.—Total length, 9.60 mm. Carapace, 3.30 mm. long, 2.50 mm. wide, 1.20 mm. in front. Abdomen, 6.40 mm. long, 1.60 mm. wide.

The leg formula is 2413, the second being not quite four and one-half times as long as the carapace.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.70	1.55	3.20	2.50	1.52	12.47 mm.
II	4.40	1.65	3.65	2.95	1.72	14.37 mm.
III	2.80	1.15	2.15	1.75	1.05	8.90 mm.
IV	4.50	1.40	3.35	2.85	1.45	13.55 mm.

The eyes of the median quadrangle are slightly farther apart, the distance between the anterior medians and laterals being proportionately less in the female.

TYPE LOCALITY.—Zion National Park, Utah, male holotype, female allotype, male and female paratypes, July 4, 1932 (Gertsch); male and female paratypes from the same locality taken in 1927 (A. M. Woodbury); male paratype, Elsinore, Utah, June 15, 1930 (Gertsch); female paratype, Monroe, Utah, July 6, 1930 (Gertsch); male paratypes, Laguna Beach, Calif., June 28, 1931 (Ivie); female paratypes, Notus, Idaho, June 11, 1931 (Ivie). Types in the collection of The American Museum of Natural History.

All records of *Tibellus duttoni* (Hentz) from the Great Basin region and west to the coast probably belong with this species. I have seen specimens from Colorado, Utah, southwestern Idaho, Arizona, and California. In Zion National Park in southern Utah it is the common species of the genus. It is a pleasure to name it for Dr. Chamberlin of the University of Utah.

Tibellus duttoni (Hentz)

Figures 4, 5, 6

Thomisus duttoni HENTZ, 1847, 'Spiders of U. S.' (reprint), Journ. Boston Soc. Nat. Hist., V, p. 448, Pl. XXIII, fig. 10; 1875, idem, p. 81, Pl. x, fig. 10.

Tibellus duttoni KEYSERLING, 1880, 'Die Spinnen Amerikas,' Laterigradæ, p. 194, Pl. IV, fig. 107.

MALE.—Total length, 6.90 mm. Cephalothorax, 2.33 mm. long, 1.75 mm. wide, .71 mm. in front. Abdomen, 4.68 mm. long, .95 mm. wide.

This species closely approximates *T. chamberlini*, new species, in color but is much more slender and has very long legs. Two pairs of spots are usually found at the distal end of the abdomen in both sexes.

The leg formula is 2413, the second being about five times as long as the carapace.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.05	1.16	2.63	2.22	1.46	10.52 mm.
II	3.66	1.33	3.16	2.75	1.66	12.56 mm.
III	2.25	.75	1.66	1.37	.96	6.99 mm.
IV	3.75	1.12	3.00	2.50	1.37	11.74 mm.

The eyes are in two strongly recurved rows, the anterior medians slightly smaller than the laterals, equally spaced about their diameter apart, the posterior row with the laterals larger, about half again as far from the medians as they are from each other. The median quadrangle is not much longer than broad, narrower in front.

The spine formula in both sexes is like that of *T. chamberlini*, the anterior tibiae with four pairs beneath.

FEMALE.—Total length, 9.67 mm. Carapace, 2.77 mm. long, 1.85 mm. wide, .95 mm. in front. Abdomen, 7.00 mm. long, 1.55 mm. wide.

The measurements are from a large female from Texas, much larger than the average representative of that sex from Georgia or Florida. The leg formula is 2413, the second pair over five times as long as the carapace.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.72	1.37	3.20	2.60	1.65	12.54 mm.
II	4.37	1.50	3.70	3.15	1.85	14.57 mm.
III	2.30	.85	1.60	1.37	.82	6.94 mm.
IV	4.35	1.85	3.30	2.70	1.40	13.60 mm.

The eyes of the median quadrangle are slightly farther apart, the comparative distance between the anterior medians and laterals being proportionately less in the female.

There seems but little doubt that this is the spider described by Hentz. His description and figure apply equally well to *Tibellus oblongus* as to this species, but as his original specimen came from Georgia, where this is the common species, I consider the name reliably established. Keyserling has given a good figure of the male palpus in his 'Die Spinnen Amerikas,' Laterigradæ, 1880, when he regarded it as valid along with *T. oblongus* (Walckenaer), which he correctly identified. *Tibellus duttoni* (Hentz) is found in the southeastern part of the United States from Florida to Texas and down into Mexico, while in its northern range it has been taken in the Mississippi Valley to Minnesota and Michigan and on the east coast in New York and neighboring states. Specimens from Florida (Tampa, male and female, 1927, Uhler, collector) (Tallahassee, males, Aug. 1903, Morse, collector) agree in every important detail with those from other states in the southeast but are paler and average a little smaller.

***Tibellus affinis* Cambridge**

Tibellus affinis CAMBRIDGE, 1898, 'Biol. Centr. Amer.,' Arach. Aran., I, p. 252, Pl. xxxi, fig. 11; 1900, idem, II, p. 133, Pl. ix, fig. 23.

As this species was described from an immature specimen, it cannot be identified without collections from the type locality, Amula, Guerrero, in southern Mexico. Structurally it is closely related to *Tibellus duttoni* and *chamberlini*, both of which undoubtedly extend down into Mexico, but I am convinced that it is not identical with either of those species.

Tibellus insularis, new species

Figure 15

FEMALE.—Total length, 11.40 mm. Carapace, 2.80 mm. long, 1.30 mm. wide, .90 mm. in front. Abdomen, 8.80 mm. long, 1.60 mm. wide.

As in the other species the carapace is marked with the median and marginal longitudinal stripes characteristic of the genus. The abdomen has the lateral stripes only faintly indicated, the dorsal median one well marked. In the posterior third of the distal part of the abdomen are two conspicuous black spots.

The leg formula is 2413, the second pair being five times as long as the carapace.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.20	1.10	2.90	2.40	1.40	11.00 mm.
II	4.00	1.40	3.60	2.84	1.60	13.94 mm.
III	2.16	.56	1.48	1.20	.80	6.20 mm.
IV	4.20	1.00	3.20	2.60	1.30	12.30 mm.

The spination of the legs is like that of *Tibellus duttoni*, the anterior tibiae being armed beneath with four pairs.

The eyes are in two strongly recurved rows, equidistantly spaced, the anterior laterals only slightly larger, the posterior row with the laterals larger, the medians half again as far from the laterals as from each other. The median ocular quad is a little broader than long, narrower in front.

The only specimen known thus far is from south of Piñar del Rio, Cuba, Sept. 12-23, 1913 (female holotype) (F. E. Lutz) (collection of The American Museum of Natural History).

APOLLOPHANES O. P. Cambridge

CAMBRIDGE, 1898, 'Biol. Centr. Amer.,' Arach. Aran., I, p. 252.

In the second volume of the above cited reference Cambridge places the five names he had previously used for species of this genus under three, and suggests that his *Apollophanes maculatipes* may be the male of the species described as *A. punctipes*. Whatever the fate of these male specimens, I am inclined to believe *A. punctiger* Cambridge is distinct from this last species, where it has been synonymized. The species of this genus are very closely related and separable in the female sex by small differences in the eye relations, proportions of the carapace, and in the epigynum. Although I have been unable to connect any of the species described below with Cambridge's described forms, a study of his figures and descriptions seems to indicate that he was dealing with more species than he suspected.

Apollophanes paraguensis, new species

Figures 19, 23, 25, 27

MALE.—Total length, 4.16 mm. Carapace, 1.88 mm. long, 1.66 mm. wide, .72 mm. in front. Abdomen, 2.28 mm. long, .82 mm. wide.

Integument of cephalothorax and appendages bright light yellow. Carapace yellow throughout, the lateral margins sparsely speckled with large flecks, indicating an indistinct broad lateral band on each side. Abdomen gray to yellow, medially with a light band, laterally with darker markings on the margins forming side bands and a dark spot on the median line at the middle of the abdomen. Legs light yellow, the dorsal and lateral surfaces of the basal joints sparsely marked with rather large maculations like those of the carapace, quite uniform in size, the distal joints immaculate. A larger conspicuous smudge or blotch at the base of all the tibiae on the lateral aspect.

Eyes in two strongly recurved rows, the anteriors about equal in size and equidistant, the posterior row much wider and about equally spaced, the medians smaller than the anteriors and the posterior laterals, which are slightly larger than those of the anterior row. Median ocular quad about as long as broad, narrow anteriorly, the medians a diameter apart, the posterior medians separated by over twice their diameter. Clypeus equal in height to twice the diameter of an anterior median eye.

FEMALE.—Total length, 4.05 mm. Carapace, 1.76 mm. long, 1.50 mm. wide, .75 mm. in front. Abdomen, 2.28 mm. long, .88 mm. wide.

The female agrees in color and in structural details with the male. The spines beneath the tibiae in both sexes are 2-2-2, the distal pair smaller. The leg formula is 2143, the measurements below being for the female.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	2.07	.70	2.62	1.53	1.30	7.95 mm.
II	2.64	1.03	2.07	1.91	1.35	9.00 mm.
III	2.07	.06	1.76	1.50	.82	6.75 mm.
IV	2.41	.65	2.41	1.62	.90	7.99 mm.

Male holotype, female allotype, and male and immature paratypes from Asuncion, Paraguay (Reimoser Collection), deposited in the Museum of Comparative Zoölogy.

***Apollophanes bryanti*, new species**

Figures 22, 26

FEMALE.—Total length, 5.41 mm. Carapace, 1.75 mm. long, 1.33 mm. wide, 1.07 mm. in front. Abdomen, 3.95 mm. long, 1.41 mm. wide.

Integument of the cephalothorax and appendages light brownish yellow. Carapace with two broad lateral brown stripes, the inner margins of which are straight, defining a median light band as broad as the posterior eye row. Clypeus with a few dark maculations. Legs heavily punctate with large round or oblong markings on the upper and lateral surfaces of the basal joints, the metatarsi and tarsi completely lacking them. Labium, sternum, coxæ, and endites immaculate yellow. Abdomen with a light hastate marking from the base to the dark spot in the center of the dorsum, the lateral margins heavily maculate, forming two bands, the venter paler and with a few darker spots.

Eyes of the anterior row equidistant and about equal in size, larger than the posterior medians but smaller than the posterior laterals. Second row of eyes about equally spaced, the medians not much more than half as large as the laterals. Median ocular quad about as broad as long, narrow in front, the anterior medians separated by

more than a diameter, while the posterior medians are over three times their diameter apart.

Spines beneath the tibiæ 2-2-2, the distal pair much smaller. (A pair of spines nearly ventral in position intermediate between the middle and distal pair are considered to be lateral.) Legs 2143.

Female holotype from Asuncion, Paraguay (Reimoser Collection) in the collection of the Museum of Comparative Zoölogy.

***Apollophanes similalis*, new species**

Figure 30

FEMALE.—Total length, 6.10 mm. Carapace, 2.33 mm. long, 2.08 mm. wide, .98 mm. in front. Abdomen, 3.91 mm. long, 1.66 mm. wide.

Integument yellowish, sparsely clothed with white hairs. Carapace with a median light band as broad as the posterior lateral eyes, the margins maculate with scattered brown flecks and markings, forming two broad side-bands. Sternum, labium, endites, and coxæ light yellowish, immaculate. Legs marked throughout with scattered flecks and spots. Abdomen clothed with white hairs, the dorsum with lateral black bands, a median longitudinal white band basally broader than that of the carapace and constricted posteriorly back of the black markings at the middle of the dorsum, the venter white with a few scattered black spots.

Both eye-rows strongly recurved, the anterior row with the medians smaller and nearer to the laterals than each other, the posterior row equidistantly spaced, the medians much smaller than the laterals. Median ocular quadrangle wider than long, the posterior medians slightly larger than the anteriors but not quite as large as the anterior laterals, the quad wider behind, the posterior medians more than three diameters apart, the anteriors separated by scarcely two diameters.

The anterior tibiæ have 2-2-2 spines beneath, the distal pair small.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	2.90	1.12	2.58	2.29	1.04	9.93 mm.
II	3.40	1.25	3.08	2.70	1.41	11.84 mm.
III	2.50	.91	1.87	1.87	.75	7.90 mm.
IV	2.87	.91	2.08	2.08	1.00	8.94 mm.

Female holotype from Sabino Basin, Santa Catalina Mts., Arizona, taken July 8-12, 1916 (Lutz) (collection of The American Museum of Natural History).

***Apollophanes arizonensis*, new species**

Figure 29

FEMALE.—Total length, 6.00 mm. Carapace, 2.16 mm. long, 2.00 mm. wide, .00 mm. in front. Abdomen, 3.91 mm. long, 2.00 mm. wide.

Integuments yellow throughout, with a sparse clothing of white hairs. Carapace practically glabrous, with a broad median light band, the sides somewhat darkened with streaks and markings indicating broad lateral bands. Sternum and basal parts of appendages unmarked yellow. Legs with a few scattered brown maculations. Abdomen with a very broad median longitudinal higher area that is somewhat in-

vaded by reddish-brown markings, the margins more heavily maculate, the characteristic median marking of the dorsum lacking.

Eyes in two strongly recurved rows, the anterior medians slightly farther apart and about equal in size to the laterals, the posterior row about equidistantly spaced, the medians much smaller. Median ocular quadrangle broader than long, the eyes subequal, the anteriors nearly two diameters apart, the posteriors separated by over three times their diameter. Clypeus about as high as the median ocular quad.

Spines under the first tibia 2-2-2, the distals smaller.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	2.71	1.21	2.33	2.24	1.08	9.57 mm.
II	3.29	1.37	3.04	2.65	1.21	11.56 mm.
III	2.50	1.00	1.95	1.76	.81	8.02 mm.
IV	2.40	.91	1.95	1.92	.91	8.09 mm.

Female holotype from Sabino Basin, Santa Catalina Mts., Arizona, taken July 8-12, 1916 (Lutz) (collection of The American Museum of Natural History).

***Apollophanes indistinctus*, new species**

Figure 28

FEMALE.—Total length, 6.00 mm. Carapace, 2.06 mm. long, 1.66 mm. wide, .90 mm. in front. Abdomen, 4.00 mm. long, 1.95 mm. wide.

Coloration as in *A. bryanti*, new species.

Eyes in two strongly recurved rows, the anterior medians smaller and nearer the laterals than to each other, the posterior eyes about equidistant, the laterals much larger. Median ocular quad broader than long, the posterior medians larger but not so large as the anterior laterals, the quadrangle narrower in front, the anterior medians separated by about two diameters while the posteriors are over three diameters apart. Clypeus about as high as the ocular quadrangle.

Spines under the anterior tibiae 2-2-2.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	2.30	.95	2.08	1.83	.91	8.07 mm.
II	2.81	1.12	2.41	2.08	1.00	9.42 mm.
III	1.83	.71	1.46	1.54	.66	6.20 mm.
IV	2.50	.81	1.81	1.83	.83	7.78 mm.

Holotype and two female paratypes from La Buena Ventura, Vera Cruz, Mexico, July, 1909 (Petrunkévitch) (collection of The American Museum of Natural History).

***Apollophanes mexicanus*, new species**

Figure 31

FEMALE.—Total length, 7.33 mm. (holotype). Carapace, 2.75 mm. long, 2.50 mm. wide, 1.25 mm. in front. Abdomen, 4.65 mm. long, 2.35 mm. wide. Total length, 5.62 mm. (paratype). Carapace, 2.20 mm. long, 2.08 mm. wide, 1.00 mm. in front. Abdomen, 3.54 mm. long, 1.37 mm. wide.

Color as in *A. indistinctus*, new species.

Eyes in two strongly recurved rows, the anterior medians much smaller than the laterals and nearer them than to each other, the posterior row equidistant, the medians much smaller. Median ocular quadrangle broader than long, the posterior medians somewhat larger than the anteriors but smaller than the anterior laterals, the quad narrower in front, where the medians are nearly two diameters apart, than behind, where the medians are over three diameters apart. Clypeus about as high as the median ocular quad.

Spines under the first tibia 2-2-2.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.33	1.54	3.75	2.58	1.25	12.45 mm.
II	4.29	1.66	2.91	3.16	1.46	13.48 mm.
III	3.12	1.25	2.40	2.50	.81	10.08 mm.
IV	3.25	1.16	2.40	2.30	.91	10.02 mm.

Female holotype and female paratypes from La Zacualpa, Chiapas, Mexico, August, 1909 (Petrunkévitch) (collection of The American Museum of Natural History).

Xysticus C. Koch, 1835

Xysticus paiutus, new species

Figures 16, 20

MALE.—Total length, 6.08 mm.

Carapace yellowish in color, with only a faint indication of a lighter median longitudinal band, the three well-defined dorsal streaks in the female missing or only faintly indicated, except near the posterior margin where they persist as black blotches. Sides of carapace orange to brown, the margins with a brown band. All eye tubercles white, except those of the posterior medians which are on brown patches. Abdomen with an indefinite pattern, mostly brown, with a few black and white transverse marks, the venter gray, black flecked.

Carapace, 2.72 mm. long, 2.68 mm. wide, 1.52 mm. in front.

Cephalothorax with black spines on the pars cephalica, six or seven long ones overhanging the chelicerae. Carapace as broad as long, highest between the second and third coxæ, longer than the first femur, shorter than the patella and tibia of the first leg, longer than the femur and patella of the third leg, the width at the front more than half that of the widest point.

Eyes of the first row recurved, the medians about half as large as the laterals, nearer to the laterals than to each other. Posterior eyes recurved, equidistant, the laterals larger. Median ocular quadrangle as wide in front as behind, broader than long, the eyes about equal. Clypeus vertical, narrower than the height of the median ocular quadrangle, scarcely more than twice the diameter of an anterior median eye.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	2.66	1.28	1.92	1.92	1.04	8.82 mm.
II	2.66	1.28	1.92	1.92	1.04	8.82 mm.
III	1.76	.80	1.12	.88	.80	5.36 mm.
IV	1.76	.80	1.20	.96	.80	5.52 mm.

MALE PALPUS.—Femur about as long as the tibia and patella which are approximately equal in length. Tibia with two processes, the ventral outer one curved, distally truncated, a prominent tubercle at about the middle. The dorsal outer process about as long but not as heavy as the other, distally oblique. Cymbium somewhat longer than broad, distally bluntly pointed, the lateral margins rounded, the tutaculum quite prominent, a rounded spur that projects ventrad. Embolus rather heavy, the truncus black, about the same size throughout its length, the pars pendula widest basally, gradually becoming narrower until it fades out near the apical end of the truncus, no apical sclerite present. Median apophysis of the bulb a large long black spur which is attached near its middle, the ends free. Distal apophysis a somewhat shorter heavy black spur that is attached at one end, the apical portion of which projects beneath the other apophysis.

FEMALE.—Total length, 6.40 mm.

Carapace light yellow, with a light median longitudinal band as wide as the front eye-row, bounded on each side by a brown streak and with a median brown streak from the posterior median eyes to the cephalic suture, the cephalic portion of the band suffused with light brown and some white dashes, the thoracic portion unmarked white except for the customary black maculation at the median cephalic suture. Margins of pars thoracica with a narrow black stripe as wide as that bounding the margin of the median band, the intervals between these bands on the sides yellow with a few invading black marks. Legs concolorous with the carapace, marked with black, with three white marks the length of the legs above, the intervals between often darkened, forming bands. Abdomen darker yellow than the carapace, the dorsum with an indefinite pattern of black spots and tan streaks, the venter light immaculate yellow.

Carapace, 3.36 mm. long, 3.12 mm. wide, 1.92 mm. in front.

Cephalothorax as broad as long, highest between the second and third coxæ, considerably longer than femur I or patella and tibia of the first leg, much longer than femur and patella of the third pair of legs, the width at the front decidedly more than one-half of the width at the widest point.

Eyes of the first row recurved, the medians about half as large as the laterals, nearer to the laterals than to each other, posterior row recurved, equidistantly spaced, the medians smaller than the laterals. Ocular quadrangle wider than long, the anterior larger, as far apart as the posteriors. Clypeus vertical, half as high as the median ocular quadrangle, about as high as two and one-half times the diameter of an anterior median eye.

EPIGYNUM.—Vulva broader than long, the anterior and lateral margins well rounded, the posterior truncated. Median longitudinal septum originating within the vulva anteriorly, broadly joined to the posterior margin, not half as wide as the width of the vulva (in some specimens narrower in front).

RANGE.—Male holotype, female allotype, and paratypes from St. George, Utah (Washington County); female paratypes from Thatcher, Arizona; female paratype from Salt Lake City, Utah (Little Cottonwood Canyon); male paratype from Notus, Idaho. (Types in the collection of the University of Utah; paratypes in The American Museum of Natural History.)

Only the examples from southwestern Utah in Washington County exhibit the conspicuous black streaks on the carapace. In many respects

this species approaches *Xysticus graminis* Emerton, a species of the eastern and New England States, but its greater size and slight differences in the palpus and epigynum will serve to separate it.

***Xysticus coloradensis* Bryant**

Figure 18

MALE.—Total length, 5.60 mm.

Carapace with a median longitudinal light band scarcely as wide as the anterior eye-row, the cephalic portion somewhat suffused with brown, the caudal part whitish, invaded by tan, the median cephalic maculation poorly defined. Median eyes on tubercles of a tan color, the laterals white. Sides of the carapace brown to black, with a few white and tan flecks. Chelicerae distally brownish, the remainder much invaded by brown. Sternum, coxae, and labium near black, flecked with white. Integuments of the legs yellow, the femora, patellæ, and tibiæ of the first two pairs heavily marked with black, the metatarsi and tarsi unmarked yellow, the last two pairs of legs lighter, blotched.

Abdomen white above, marked with a few black and tan spots, the venter whitish.

Carapace, 2.80 mm. long, 2.64 mm. wide, 1.20 mm. in front.

Cephalothorax set with spines as in typical *Xysticus*, six long black ones projecting over the chelicerae. Carapace slightly longer than wide, somewhat highest between the second and third coxae, the width at the front less than one-half the greatest width, shorter than the first femur, decidedly shorter than the tibia and patella of the first leg, shorter than the femur and patella of the third leg.

Eyes of the first row recurved, the medians nearer to the laterals than to each other, nearly half as large as the laterals. Posterior row recurved, the medians nearer to each other, smaller than the laterals. The tubercles of all the eyes conspicuous, those of the median quad high, conical, larger than in any species of the genus that I have yet seen. Median ocular quadrangle decidedly longer than broad, about as wide in front as behind, the eyes practically equal. Clypeus vertical, less than the height of the ocular quad, equal to about two and one-half times the diameter of an anterior median eye.

Legs all spinose, the first two tibiæ armed beneath with five pairs of long spines, the last two tibiæ with three pairs, the first two metatarsi with five pairs beneath. First two pairs of legs equal in length, the fourth slightly longer than the third (8.16-7.04).

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.04	1.20	2.32	2.56	1.20	10.32 mm.
II	3.04	1.20	2.32	2.56	1.20	10.32 mm.
III	2.24	.80	1.60	1.52	.88	7.04 mm.
IV	2.40	.80	1.92	1.92	1.12	8.16 mm.

MALE PALPUS.—Patella and tibia about the same length, the two equal to the femur. Tibia with two well-defined processes, the first an outer dorsal chitinized spur that is curved toward the bulb (dorsad), the second apophysis about as long, in lateral profile about half as broad as the former and situated on the outer dorsal surface; tibia also with a conspicuous large tubercle on the outer lateral aspect, the interval between it and the true apophysis excavated. Cymbium somewhat longer

than broad, bluntly pointed, the lateral margins quite straight, the tutaculum prominent, the inner cymbial portion a long chitinous spur that is directed laterad. Embolus heavy, the pars pendula easily seen for most of the length, without an apical sclerite. Bulb of palpus with a heavy bilobed process, the most outer spur deeply notched, the whole process apparently belonging to the distal bulbal portion.

RANGE.—Utah may be added to the list of states in which this species is found.

***Xysticus gosiutus*, new species**

Figures 17, 21

MALE.—Total length, 5.68 mm.

The median longitudinal light band of the carapace anteriorly is as wide as the first eye row, gradually narrowing caudad to about half that width, the cephalic portion orange with white streaks, the posterior lighter, a creamy white semilunar maculation at the cephalic suture. Eye region bright red, the tubercles light brown. Sides of the carapace a bright reddish-brown. The integument of the legs yellow to orange, the femora and patellæ of the first pair bright red, the tibiæ with basal and distal red annulæ, the metatarsi and tarsi yellow; the other three pairs of legs flecked with red and white. Tarsus of male palpus white above, brown blotched.

Abdomen above basally white with brown or black transverse bands and streaks, the venter with a large black spot between the spinnerets and the pedicel.

Carapace, 2.72 mm. long, 2.56 mm. wide, 1.36 mm. wide in front.

Clypeal margin with six long spines, the rest of the carapace sparsely set with shorter ones. Carapace a little longer than broad, shorter than femur I, scarcely longer than the tibia of the first leg, slightly shorter than the femur and patella of the third leg, highest between the second and third coxæ, the width at the front more than half the width at the widest point.

Eyes of the first row recurved, nearer to the larger laterals than to each other. Eyes of the second row recurved, the medians smaller and nearer to each other (3.0/4.0) than to the laterals. Median ocular quadrangle longer than wide, the posterior medians slightly larger, as far apart in front as behind. Clypeus vertical, about half as wide as the height of the ocular quadrangle, equal to about twice the diameter of an anterior median eye.

The first two pairs of legs equal in length, the last leg somewhat longer than the third, all legs spinose. The tibiæ of the first two pairs with five pairs of spines beneath, the metatarsi of the first two pairs of legs with five pairs.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	3.28	1.12	2.56	2.48	1.28	10.72 mm.
II	3.28	1.12	2.56	2.48	1.28	10.72 mm.
III	2.00	.88	1.44	1.28	.88	6.48 mm.
IV	2.08	.88	1.68	1.44	.88	6.96 mm.

MALE PALPUS.—Femur of male palpus about as long as the patella and tibia which are nearly equal. Tibia with two processes, the lower outer one heavy, curved, the outer dorsal about as long, bluntly ended, not as heavy as the other. Cymbium longer than broad, laterally rounded, apically bluntly pointed. Tutaculum not prominent, the outer cymbial portion a blunt process. Embolus with the truncus

black, about the same width throughout its length, the pars pendula present through most of the length, the apical sclerite missing. Bulb of the palpus with a long, hook-like medial and a short distal apophysis.

FEMALE.—Total length, 6.24 mm.

Carapace with a median longitudinal band as wide as the first eye-row, the anterior portion light reddish-brown, the remainder white or nearly so, a creamy white semilunar streak at the median cephalic furrow, which lacks the customary dark maculation. Eye tubercles and region white. Sides of the carapace reddish yellow, with two darker bands at each side of the median longitudinal band. Abdomen sub-orbicular, pinkish, irrorate in brown.

Carapace slightly longer than broad, highest between the second and third coxæ, decidedly longer than the first femur, longer than the tibia and patella of the first pair of legs, longer than the femur and patella of the third leg, the width at the front somewhat wider than half the greatest width.

Eyes of the first row recurved, the medians twice as far from each other as to the laterals which are over twice as large. Posterior row of eyes recurved, the medians smaller and nearer to each other than to the laterals. The median ocular quadrangle wider than long, the eyes near equal, the width in front only slightly wider than behind (6.0/5.5). Clypeus vertical, not as high as the height of the median ocular quadrangle, about two and one-half times the diameter of an anterior median eye.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
I	2.40	.88	1.84	1.60	.88	7.60 mm.
II	2.40	.88	1.84	1.60	.88	7.60 mm.
III	1.92	.80	1.36	.88	.80	5.75 mm.
IV	2.00	.80	1.44	1.20	.80	6.24 mm.

FEMALE EPIGYNUM.—Vulva much broader than long, anteriorly flattened, laterally rounded, posteriorly somewhat flattened. Median septum very broad, widest in front, with the lateral extensions turned up (ventrad), forming two black chitinous ridges (closely resembling *X. locuples* Keyserling). The openings of the fertilization canals appear as two black spots much nearer the vulva than to the genital furrow. The atriobursal orifices are located at each side of the median septum and the heavy tubelike ridges somewhat fill that portion of the atrium.

RANGE.—Male holotype, female allotype, and paratypes of both sexes from Little Cottonwood Canyon, Salt Lake City, Utah, swept from the wild rose, July 17, 1929 (Gertsch); female and male paratypes from Zion National Park in southern Utah, July 4, 1931 (Gertsch). Types in the collection of the University of Utah; paratypes in The American Museum of Natural History.

This species is closely related to *Xysticus locuples* Keyserling which is found in the same locality, but it can be separated by differences in the eye relations, by the proportions of the apophyses on the bulb of the male palpus, and characters in the epigynum best shown by a figure. Keyserling's species is a heavier spider and lacks the normal long spines on the pars cephalica.

Xysticus apachecus, new species

Figure 24

FEMALE.—Total length, 8.08 mm.

Integument of the cephalothorax white to yellow, the carapace with a broad median longitudinal white band the width of the first row of eyes, immaculate, the customary black maculation at the cephalic suture absent. Eye tubercles and eye region white. The sides of the carapace light brown, two large black spots near the margins behind. Integument of the legs white, the first two pairs only marked faintly, the last two pairs, especially the femora, blotched in brown and with some creamy white maculations. Abdomen yellow, with a median white band on the dorsum, from which extend four transverse streaks on each side, below which are corresponding black streaks. Venter creamy white with brown markings.

Carapace, 3.28 mm. long, 3.12 mm. wide, 1.84 mm. in front.

Cephalothorax lacking the conspicuous long spines of other species of the genus, the eye region practically smooth and with only short spines, the margin of the clypeus with the customary seven or eight long spines projecting over the chelicerae. Carapace slightly highest between the second and third coxae, anteriorly very gradually sloping to the eye region, posteriorly abruptly falling to the margin, slightly longer than broad, about as long as femur I, shorter than the tibia and patella of the first leg, longer than the femur and patella of the third leg, the width at the front more than half of the greatest width.

Eyes of the first row recurved, the medians less than half as large as the laterals, to which they are nearer than to each other. Eyes of the second row recurved, equidistant, the medians more than half as large as the laterals. Median ocular quadrangle only slightly narrower in front, wider than long, the medians (anterior) slightly smaller. Clypeus not quite as high as the height of the median ocular quadrangle, equal to about three times the width of an anterior median eye.

Legs with few spines, tibia I and II with six pairs and a single unpaired below, the metatarsi of these legs with five pairs beneath.

	FEMUR	PATELLA	TIBIA	METATARSUS	TARUS	TOTAL
I	3.20	1.36	2.72	2.18	1.12	10.58 mm.
II	3.20	1.36	2.72	2.18	1.12	10.58 mm.
III	2.16	.80	1.60	.96	.88	6.40 mm.
IV	2.40	.80	1.66	1.20	.88	6.94 mm.

EPIGYNUM.—Vulva broader than long, the anterior margin straight, the lateral margins straight, diverging back at an obtuse angle, the posterior margin rounded. Median longitudinal septum broadly joined to the margins, caudally narrowed, the lateral septal margins revolved into a black chitinous tubular ridge on each side.

Female holotype from Blanding, Utah, April 17, 1928; female paratype from Texas (Cornell Collection) and from Grand Canyon, Arizona, north rim, July, 1931 (Gertsch). Types in the collection of the University of Utah; paratypes in The American Museum of Natural History.

This interesting species differs from all others of the genus in being devoid of the conspicuous long spines on the pars cephalica. It is closely related to *Xysticus locuples* Keyserling, *X. gosiutus*, new species, and to other undescribed forms that possess this type of epigynum.